

On the species of *Euxanthellus* Silvestri in South Africa (Hymenoptera: Aphelinidae)

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Three species of *Euxanthellus* are recognized and distinguished: *philippiae* Silvestri, *subochraceus* (Howard) and *adustus* spec. nov. A key is given to distinguish both sexes of the three species.

INTRODUCTION

Fairly large collections of the males and females of African species of *Euxanthellus* Silvestri, 1915 have twice been reported on: once by Compere (1936) who recognized and redescribed the type-species, *E. philippiae* Silvestri, published a brief redescription of the types of *subochraceus* (Howard), and briefly characterized – without naming – seven series of variant specimens about the status of which he was uncertain. Later Annecke (1964) placed a large amount of material in five groups, three of females and two of males, and suggested tentatively that his groups I and IV may be males and females of the type-species, III may possibly be females of *subochraceus*, while groups II and V could perhaps be the two sexes of a form distinct from both *philippiae* and *subochraceus*.

Since 1964 much additional South African material has been bred from field-collected lecaniine and other coccoids, and, through a fortunate circumstance described below, the identity of *subochraceus* has been firmly established. Almost all this material can be placed without hesitation in one or other of Annecke's (1964) groups (or as males of *subochraceus* which are now available) and we now conclude that three species are involved, namely, the type-species, Howard's species and a hitherto unnamed species which is here described as new.

A few small lots cannot be identified with any of the three species recognized here, some of which may agree with one or more of Compere's (1936) variant series. Unfortunately, this material is scanty and until this can be rectified, these forms can not be studied in detail.

Euxanthellus philippiae Silvestri, fig. 1

Euxanthellus philippiae Silvestri, 1915: 322-3; Compere, 1931a: 255; 1936: 282-3; Annecke & Insley, 1971: 34

Euxanthellus sp., Smith & Compere, 1928: 264-9; Annecke, 1964: 23-6 (as groups I and IV).

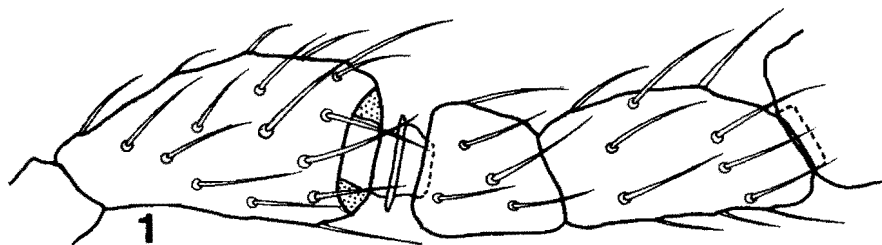
This species may be recognized from the detailed published descriptions of Silvestri (1915), Compere (1931a; 1936) and Annecke (1964, as Groups I and IV). Further redescription is not necessary, save to amplify earlier counts of certain thoracic setae and relative lengths of ovipositor and middle tibia. These counts and measurements are given in Table 1.

TABLE 1. Number of scutellar and axillar setae on female of *Euxanthellus philippiae* Silvestri (65 specimens), *E. adustus* spec. nov. (63 specimens) and *E. subochraceus* (Howard) (13 specimens); values are given for the mean, the range, and the range of the majority (about 80%) of the measured specimens.

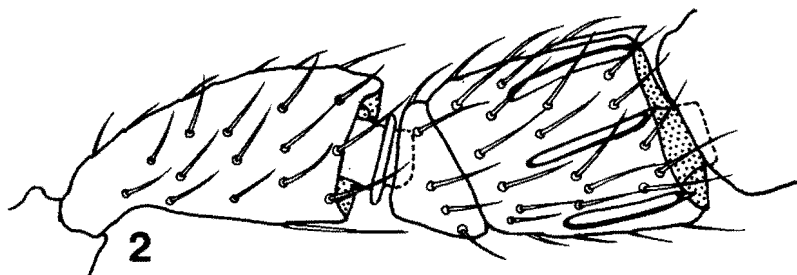
	Scutellum			Axilla		
	mean	range	80%	mean	range	80%
<i>philippiae</i>	23.5	12-48	16-30	8.8	4-15	6-11
<i>adustus</i>	35.2	12-62	26-46	8.8	2-16	5-13
<i>subochraceus</i>	73.2	46-88	66-84	16.7	9-23	12-22

E. philippiae may be distinguished from the other two congeners in South Africa according to the accompanying key. The male of this species is readily separated from that of *subochraceus* by colour, but it is superficially very similar to the male of *adustus*, differing from the latter only in a few structural characters – visible only in cleared slide-mounted specimens – as mentioned by Annecke (1964). In addition, counts of thoracic setae have now shown that in *E. philippiae* a large majority of the specimens have unequal numbers of setae on the left and right axilla, whereas almost every specimen in *adustus* was found to have the same number of setae on both axillae. Although we are not certain about the value of this rather unusual character, it has proved to be at least of some use in distinguishing the males of these two species.

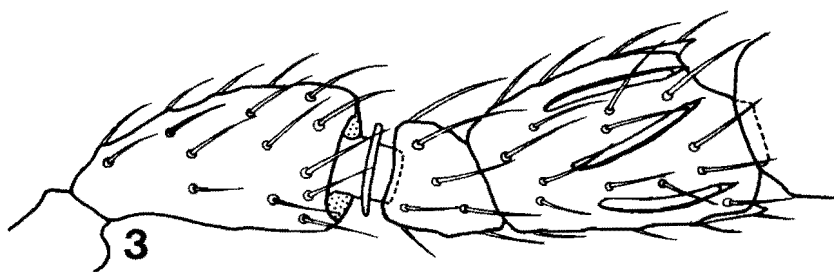
MATERIAL EXAMINED. 82 ♀ and 35 ♂ with the following collection data: SOUTH AFRICA: Rustenburg, Tvl., xii.1964, E. C. G. Bedford, ex soft green scale on citrus (T 1923, 14 ♀ 4 ♂); Pretoria, Tvl., x.1965, D. P. Annecke, ex *Ceroplastes* sp. on Jacaranda (T 2061, 14 ♀); Bronkhorstspuit, Tvl., i.1966, J. Munting, ex *Coccus hesperidum* on peach (T 2551, 3 ♀); Krugersdorp, Tvl., x.1968, H. P. Insley, ex *Coccus rhodesiensis* on *Loranthus zeyheri* (T 2858, 12 ♀); Stellenbosch, C.P., x.1968, V. B. Whitehead, ex *Coccus elongatus* on *Ceratonia siliqua* (T 2859, 16 ♀ 1 ♂); Stellenbosch, C.P., ii.1969, H. P. Insley, ex *Gascardia destructor* on *Rhus cortinus* (T 2986, 3 ♀); same locality and collector, x.1969, ex *Coccus elongatus* on *Ceratonia siliqua* (T 3271, 6 ♀ 1 ♂); Somerset West, C.P., ii.1969, H. P. Insley, ex *Ceroplastes* sp. on *Rhus angustifolia* (T 2936, 13 ♀); Winkelspruit, Ntl., xi.1970, H. P. Insley, ex *Ceroplastes eugeniae* on *Chaetacme aristata* (T 3720, 4 ♀ 3 ♂). Specimens in Plant Protection Research Institute, Pretoria.



philippiae



subochraceus



adustus

Figs 1-3. *Euxanthellus* spp., female antennae, showing pedicel and basal two funicle segments. 1. *E. philippiae* Silvestri (T 2061-1). 2. *E. subochraceus* (Howard) (T 4580-1). 3. *E. adustus* spec. nov. (T 2217-1).

Euxanthellus subochraceus (Howard), fig. 2**Coccophagus subochraceus** Howard, 1907: 80**Euxanthellus subochraceus** (Howard): Smith & Compere, 1928: 264; Compere, 1931b: 11; 1936: 283**Euxanthellus** sp., Annecke, 1964: 23-6 (as Group III).

This species was described from 5 ♀ and 25 ♂ specimens, the types, collected in the eastern Cape Province in 1897, and submitted to L. O. Howard by C. P. Lounsbury. Recently, our colleague, Dr Y. Ben-Dov, came across two slides in a box of Lounsbury's coccoid slides in the National Collection of Insects, Plant Protection Research Institute, Pretoria. These two slides contained a few male coccids, and 2 ♀ 10 ♂ of *Euxanthellus* sp., mounted in glycerine and ringed with asphalt, and were labelled apparently by Lounsbury. Both bore the number Ac 1314 which, in Lounsbury's accession book, provides the following information: "Lecanium. Leucospermum attenuatum. S. D. Bairstow. Zuurborg C. C. July 1897. ♂ (illegible). Parasites sent to L.O.H. Material in tin." It is clear that for all practical purposes this material may be regarded as type material. Accordingly, in an attempt to clarify the identity of this poorly known species, 1 ♀ 5 ♂ were removed from one of the slides and remounted separately in balsam, after clearing in caustic soda.

Compere (1936) published a redescription prepared by A. B. Gahan of the types of *E. subochraceus*. This redescription led Annecke (1964) to suggest tentatively that the females of his *Euxanthellus* Group III may possibly represent that species. At that time no males were available which could be associated with the Group III females, a lack which has since been supplied in the collections detailed below.

Descriptions of *E. subochraceus* were published by Howard (1907, as *Coccophagus*), Gahan in Compere (1936) and Annecke (1964, as *Euxanthellus* Group III). These descriptions are briefly summarized and, where necessary, amplified here.

FEMALE. Colour clear pale yellow, often with admixtures of usually pale brownish, only the median part of pronotum and adjoining anteromedian part of mesoscutum usually with a conspicuous dark brown mark; smaller specimens often more liberally marked with pale brownish, including dorsum of gaster, propodeum and metanotum, and axillae; dorsal mesonotal sutures often thinly brown; wings hyaline; legs whitish, unmarked save extreme tips of tarsi which are dusky. Antenna with four funicle segments, the first (fig. 2) usually subtriangular in profile, broadly connected to the second, the septum often partly obliterated on one side, the two together not, or hardly, distinguishable as two segments except in cleared, slide-mounted specimens; scutellum and each axilla usually with more setae (see Table 1) than in the other two species; ovipositor as seen through the derm in cleared specimens usually slightly shorter than middle tibia (see Table 2), the two occasionally of equal length, and rarely (a single undersized specimen) ovipositor longer than middle tibia.

MALE. The striking character of the male is the pale mesoscutum, concolorous with scutellum and not marked with a large V-shaped figure as in the other two species; pronotum more or less widely blackish above; mesoscutum blackish at most narrowly along anterior edge; axillae more or less widely blackish-brown; metanotum, propodeum, basal tarsal segment of middle leg, and entire gaster all blackish-brown. Scutellum with 28-60 setae, axillae each with 5-13; basal tarsal segment of middle leg cylindrical, slender, fully as long as, or slightly longer than, tibial spur, with usually six

coarse spines similar to those grouped at apex of tibia; digital lobes of volsella similar to those of *philippiae*, not, or hardly, longer than wide, relatively a little smaller than in *philippiae* and less distinctly separated from volsella, apparently more or less fused to the latter.

The only known host of *E. subochraceus* is the coccid, *Marsipococcus proteae* (Brian), and perhaps other related species, that are found on proteaceous plants in the south-western and south-eastern Cape Province.

MATERIAL EXAMINED. 326 ♀ and 149 ♂ with the following collection data: SOUTH AFRICA, Cape Province: Zuurberg, July 1897, S.D.B., *Lecanium* on *Leucospermum attenuatum* (T 4580, 2 ♀ 10 ♂); Port Elizabeth (Longmore), ix.1961, J. S. Taylor, ex *Coccus proteae* on *Leucospermum ellipticum* (T 1101, 4 ♀); Klipheuwel, x.1968, H. P. Insley, ex soft scale on *Leucadendron levisanum* (T 2799, 270 ♀ 134 ♂); Worcester Distr., ii.1969, H. P. Insley, ex *Marsipococcus* sp. on *Leucadendron* sp. (T 2977, 50 ♀ 5 ♂).

Euxanthellus adustus spec. nov., fig. 3

Euxanthellus sp., Annecke, 1964: 23-6 (as Groups II and V).

This species was differentiated from its congeners by Annecke (1964). Redescription is not needed except to amplify the counts of mesonotal setae (Table 1) and relative lengths of ovipositor and middle tibia (Table 2). An additional character that may be of some value in separating the male from that of *philippiae* is mentioned in the notes on the latter species. Both sexes of *E. adustus* may be distinguished as indicated in the accompanying key.

TABLE 2. Length of ovipositor and middle tibia of *Euxanthellus philippiae* (65 specimens), *E. adustus* spec. nov. (63 specimens) and *E. subochraceus* (Howard) (12 specimens); values are given for the mean, the range, and the range of the majority (about 80%) of the specimens. Lengths are given in mm.

	Ovipositor			Middle tibia		
	mean	range	80%	mean	range	80%
<i>philippiae</i>	0.430	0.34-0.49	0.40-0.46	0.353	0.24-0.44	0.28-0.41
<i>adustus</i>	0.390	0.28-0.48	0.35-0.45	0.313	0.20-0.39	0.28-0.38
<i>subochraceus</i>	0.303	0.28-0.33	0.29-0.31	0.316	0.24-0.40	0.29-0.34

MATERIAL EXAMINED. ♀-Holotype, 57 ♀ and 12 ♂ paratypes with the following data: SOUTH AFRICA: Pietersburg, TvL., iv.1966, G. J. Snowball, ex *Gascardia destructor* on *Maytenus senegalensis* (T 2217, holotype, 6 ♀ 9 ♂; T 2289, 42 ♀ 3 ♂); same data except collector, D. P. Annecke (T 2210, 4 ♀); vi.1966, G. J. Snowball, ex *Coccus ehretiae* on *Maytenus senegalensis* (T 2367, 5 ♀). Additional material not designated as types: SOUTH AFRICA: Letaba, TvL., vii.1966, H. D. Catling, ex *Gascardia* sp. on

citrus (T 2361, 20 ♀ 2 ♂); ix.1966, J. Conradie, ex *Gascardia* sp. on citrus (T 2366, 62 ♀ 2 ♂); Tzaneen, Tvl., ii.1964, C. J. Cilliers, ex *Ceroplastes brevicauda* on citrus (T 1652, 1 ♀); Waterberg, Tvl., iii.1974, G. L. Prinsloo, ex *Ceroplastes* sp. on *Ochna pulchra* (T 4871, 18 ♀); Pienaarspoort, Tvl., ii.1964, C. J. Cilliers, with *Dentachionaspis ? lounsburyi* on *Maytenus cymosus* (T 1783, 183 ♀ 39 ♂); ex *Coccus ehretiae* on *Rhus lancea* (T 1761, 20 ♀ 4 ♂); Krugersdorp, Tvl., v.1968, H. P. Insley, ex *Coccus ?rhodesiensis* on *Loranthus zeyheri* (T 4937, 1 ♀); same data except date, x.1968 (T 3174, 3 ♀); Naboomspruit, Tvl., ii.1964, C. J. Cilliers, ex *Ceroplastes destructor* on *Seringa* (T 1762, 16 ♀); East London, C.P., i.1968, C. J. Cilliers, ex *Ceroplastes* sp. on unknown plant (T 2535, 4 ♂); Jefferies Bay, C.P., iii.1970, H. P. Insley, ex *Ceroplastes elytropappi* on *Passerina vulgaris* (T 3391, 116 ♀ 183 ♂); Addo, C.P., iii.1964, W. Hanekom, ex *Coccus hesperidum* on citrus (T 1692, 5 ♀ 15 ♂). Holotype and paratypes in National Collection of Insects, Plant Protection Research Institute, Pretoria; paratypes to be deposited in British Museum (Natural History), London, and in United States National Museum, Washington.

Key to the species of *Euxanthellus* Silvestri in Africa

MALES AND FEMALES

1. Body, except pronotum, with a boldly contrasting pattern of black and yellow markings; antenna with three funicle segments; males 4
- Body, except pronotum, pale yellow with or without variable, usually pale, brownish admixtures; antennal funicle with four segments; females 2
2. Second funicle segment not or little broader than the first, lacking rhinaria (fig. 1); scutellum usually with 16–30 setae; body, except pronotum, clear pale yellow, rarely faintly brushed with pale brown dorsally **philippiae**
- Second funicle segment distinctly broader than first, with rhinaria; scutellum usually with more numerous setae; body, except pronotum, frequently with distinct brownish suffusions on dorsum of thorax and gaster 3
3. Scutellum usually with 66–84 setae; each axilla usually with 12–22 setae; ovipositor usually shorter than, occasionally as long as, middle tibia; basal two funicle segments as in fig. 2 **subochraceus**
- Scutellum usually with 26–46 setae; axilla usually with 5–13 setae; ovipositor longer than middle tibia; basal two funicle segments as in fig. 3 **adustus**
4. Mesonotum pale yellowish, concolorous with scutellum, except at most narrowly along anterior edge, without a bold contrasting V-shaped figure in black or blackish-brown **subochraceus**
- Mesonotum largely blackish-brown in a V-shaped figure leaving only lateral and posterior parts yellowish 5
5. Digital lobes of volsella short, not much, if any, longer than broad; basal tarsal segment of middle leg slender, not swollen, variable in length, most often with 4–7 stout, peg-like spines **philippiae**
- Digital lobes of volsella long, at least twice as long as wide; basal tarsal segment of middle leg more or less swollen, usually only slightly longer than wide, without or at most with three peg-like spines **adustus**

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REFERENCES

- ANNECKE, D. P. 1964. The Encyrtid and Aphelinid parasites (Hymenoptera: Chalcidoidea) of soft brown scale, *Coccus hesperidum* Linnaeus (Hemiptera: Coccidae) in South Africa. *Entomology Mem. Dep. agric. tech. Serv. Repub. S. Afr.* **7**: 1-74.
- ANNECKE, D. P. & INSLEY, H. PATRICIA. 1971. Catalogue of Ethiopian Encyrtidae and Aphelinidae (Hymenoptera: Chalcidoidea). *Entomology Mem. Dep. agric. tech. Serv. Repub. S. Afr.* **23**: 1-53.
- COMPERE, H. 1931a. A discussion of the parasites of *Saissetia oleae* (Bern.) collected in Eritrea. *Univ. Calif. Publs Ent.* **5**: 247-255.
- 1931b. A revision of the species of *Coccophagus*, a genus of hymenopterous, coccid-inhabiting parasites. *Proc. U.S. natn. Mus.* 1-132.
- 1936. Notes on the classification of the Aphelinidae with descriptions of new species. *Univ. Calif. Publs Ent.* **6**: 277-322.
- HOWARD, L. O. 1907. New genera and species of Aphelininae with a revised table of genera. *Tech. Ser. Bur. Ent. U.S.* **12**: 67-88.
- SILVESTRI, F. 1915. Contributo alla conoscenza degli insetti dell'olivo Eritrea e dell'Africa meridionale. *Boll. Lab. Zool. Portici* **9**: 240-334.
- SMITH, H. S. & COMPERE, H. 1928. A preliminary report on the insect parasites of the black scale, *Saissetia oleae* (Bernard). *Univ. Calif. Publs Ent.* **4**: 231-334.

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